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COMMUNICATIONS STRATEGIC PLAN

VOICE OF COMMAND

Civil Air Patrol

Communications Strategic Plan

1 December 1998

Vision: Our vision is to develop:

a. An effective and efficient communications capability accurately tailored to meet the needs of the organization

b. A communications capability utilizing the best resources available from current technology, both CAP-indigenous and out-sourced systems

c. A professional communications system compliant with all applicable regulatory guidance

d. A fully-funded means of acquisition and fielding necessary resources while continuously evaluating hardware and training upgrades for the future

e. A corps of communications managers who regularly evaluate the communications requirements of the organization and implement sound plans to meet the needs

Background: Today's Situation

a. The communications system in use by the organization is significantly out of date and in many cases does not adequately meet the needs of the organization. Many system components have greatly exceeded reasonable life expectancies and most fail to comply with current mandatory specifications IAW our frequency assignments.

b. Meanwhile, as we begin taking steps to upgrade a system which fails to meet today's standards, the controlling agency for all federal frequency use has mandated new "Narrowband" FM standards which will require the complete replacement of our nation-wide VHF system by 31 Dec 2005.

c. Hindering our ability to face either of the challenges above is the lack of adequate funding for the communications program. Estimates of total organizational need show that current funding levels in both acquisition and operations/maintenance are at approximately 10% of the required level.

Goals: What we plan to do

a. Bring the CAP communications system into compliance with all applicable regulatory guidance.

b. Identify upcoming changes in the regulatory guidance and implement plans to upgrade the system as necessary.

c. Secure full federal funding for the CAP communications program.

Discussion:

In the past 50 years of organizational history, proactive management and strategic planning in the communications program have been extremely difficult. Since most of the system was "privately owned," communications managers were severely handicapped in their ability to respond to the needs of the organization in key points of communications.

However, in the last few years, several factors have focused our attention on the need to change the status quo and move the Civil Air Patrol communications system forward. Principle among these is the mandated upgrade of our VHF/FM system to new narrowband specifications by 31 December 2005. Since practically none of the equipment in our present inventory meets these new standards, the change to narrowband will require a total replacement of our VHF system.

With the costs of this state-of-the-art equipment being much higher than the equipment solutions we've relied on in the past, it will not be practical to rely on member funding of this upgrade. Without a doubt many members will purchase some of these radios for their use in support of the organization but for planning purposes there is no way to predict or rely on those numbers.

Therefore, NHQ has begun planning the mandated system upgrade. This document is intended to be the foundation of CAP efforts to meet these challenges.

In preparing this plan, we conducted a field survey in the spring of this year (98) to give us a first glance at the overall communications needs of the organization. The data produced from this survey is not completely definitive in nature but it will be valuable for planning purposes. As this plan is implemented the data will improve as actual requirements are validated by each individual wing and region.

The inputs received from our 1998 field survey reflects a need for a communications system which meets the following objectives:

- Wing Commander and their staff able to *direct* and *supervise* all mission deployed field activities in a timely manner.
- Mission Coordinators able to both *direct* the mission and *report* the status and location of all assets in the field in a timely manner.
- Timely communications between Mission Base, Wing Headquarters, Region Headquarters, National Operations Center, AF/RCC, AF/NSEP, and the State office of primary responsibility as well as any other allied agencies, such as FEMA, DEA, Coast Guard, etc.
- Corporate aircraft able to communicate timely information to the ground, in addition to normal communications with air controllers.
- Corporate vehicles able to report timely information to the Mission Base as to their location, status, and any findings from anywhere in the field.
- All CAP units able to relay command direction as well as administrative messages in a timely manner.
- All involved agencies able to provide coordinated tactical liaison communications in the management of a mission activity.

Network Planning

These system expectations will serve as the basic design criteria for future redesign of the communications system. All echelons of the organization must evaluate their ability to meet these expectations. National Headquarters will begin the process by authoring a National Network Plan which will define the overall network and assign responsibility for applicable segments to the appropriate CAP echelons. Regions will define their portions of the overall national plan by implementing a region network plan. Finally, each wing will complete the network planning process by creating a wing network plan.

The national network plan will provide overall vision and needs of the national communications system. The region plans will expand upon the national plan and define the region portion of the overall national system. And perhaps the most important element in this planning process will be the wing network plan. The wing network plan will outline the wing's responsibilities to the region and national plans and will define that wing's unique communications requirements.

Specifically, each plan must identify how the communications requirements will be meet including the identification of required people, training, and equipment assets to perform the mission.

As we plan for the immediate challenges, a critical product of this network planning will be the determination of our equipment requirements. Without defined and documented requirements it is impossible to plan for the acquisition of the necessary assets.

Acquisition Planning

In response to the narrowband challenge, NHQ will continue our efforts to fully fund the communications equipment needed to meet the mandated deadlines. Ultimately, acquisition and distribution of assets will be based on the validated equipment requirements identified in the region and wing network plans.

In the interim, acquisition planning at the national level will be based on information derived from the 1998 survey until field level network plans provide better data. Specifically, that survey reflects the following field needs (averaged):

Unit Headquarters:	**Mission Bases:**	**Mission Coordinators:**	**Mission Aircraft:**
Phone Lines: 2	Phone Lines: 3	VHF/FM Bases: 1	VHF/FM: 1
Fax Machines: 1	VHF/FM Bases: 2	Pagers: 1	DF Receivers: 1
Computers: 1	VHF/FM Mobiles: 10	Prepaid Phonecards:1	
VHF/FM Bases: 2	VHF/AM Bases: 1		**Deployable Comm:**
VHF/FM Mobile: 3	Computers: 2	**Ground Teams:**	Dedicated Vehicle: 1
HF Stations: 1	Fax Machines: 1	VHF/FM Mobiles: 1	HF: 1
	VHF/AM Handhelds: 2	VHF/FM Handhelds: 2	VHF/FM: 2
Other Corp. Vehicles	Generators: 1	DF Units: 1	VHF/AM: 1
VHF/FM: 1	HF Base: 1	HF (for some areas): 1	VHF Tactical Rptr: 1
	Pagers: 4		Generator: 1

The appearance of telephones, fax and computers in this data does not necessarily mean the communications program is considering expansion into these areas. However, these capabilities play a part in the overall communications capability and must be considered at the same time as traditional radio solutions communications. While communications managers may not control these other avenues of connectivity we must consider the whole picture of communications capabilities when determining the organization's communications requirements.

Using the data indicated from the Requirements Survey we can project some system-wide totals for initial acquisition planning. These figures give us indications about the size of the system we are endeavoring to replace and support but remember, these figures are projections. As explained above, the final totals will only be firm after the network plans are generated and validated for each wing and region. However, for interim planning purposes, the data indicates the following averages for a typical wing and region and a total for the entire system.

Asset	Average Wing	Average Region	Total Numbers	Cost per Unit	Total Cost
VHF/FM Base	53	3	2780	$1,961	$5,451,580
VHF/FM Mobile	93	7	4892	$1,662	$8,130,504
VHF/FM Handheld	88	5	4616	$685	$3,161,960
VHF/FM Repeater	10	0	550	$10,300	$5,665,000
HF Fixed	23	5	1236	$2,030	$2,509,080
HF Mobile	6	1	320	$2,655	$852,800
Aircraft VHF/FM	10	1	530	$6,800	$3,604,000
VHF/AM Base	9	2	484	$1,200	$580,800
VHF/AM Handheld	13	1	684	$300	$205,200
					$30,160,924

Data Assumptions. The figures shown above are in flat line 1998 dollars. At the time of this plan there is a limited market for equipment meeting NTIA specifications (i.e., current specifications for HF; narrowband for FM). For planning purposes, the item costs shown above are based on these current market indicators:

VHF/FM Radio (for mobile or fixed application)	$1615
Mobile Antenna (with coax and connectors)	47
Fixed Antenna (with coax and connectors)	251
Fixed Use Power Supply	95
VHF/FM Handheld (with battery and charger)	$685
VHF/FM Repeater (with antenna, duplexer, 300 ft. hardline and connectors)	$10300
HF Radio (for mobile or fixed application)	$1695
Mobile Antenna (tuner, coax and connectors)	960
Fixed Station Support (power supply, coax and connectors)	335
Aircraft VHF/FM (with two channel audio panel)	$6800
VHF/AM Base (with ant., coax and connectors)	$1200
VHF/AM Handheld	$ 300

At the present time the potential for funding of the CAP Communications System is uncertain. Efforts are underway at several levels to secure the funding necessary to upgrade and maintain the system based on the documented requirements, but the success of those efforts cannot be guaranteed. For this reason, we have developed two acquisition plans. This first assumes a normal (that is, fully funded) situation and the second is a Crisis Plan which assumes a continuation of the current, under-funded situation.

Acquisition under normal circumstances

Wings and regions will periodically review their communications equipment requirements as identified in their Network Plan. Changes to this plan will require concurrence at both region and national level. The equipment requirements in this document will form the basis of acquisition planning at all levels.

Our acquisition planning assumes a 10 year expected life cycle for all required equipment assets. Based on this assumption wings and regions can expect those items they have identified as being required in their Network Plan to be replaced approximately every ten years.

National Headquarters will implement contracts as necessary to meet these expectations. National level contracts are based on large number requirements to take advantage of volume discounting and in order to comply with minimum contract size limitations specified for the type of appropriated funds used in this program. Therefore, the exact date of replacement for a specific item could potentially occur slightly earlier or later than its exact ten year anniversary.

Crisis Acquisition Plan

This portion of the plan assumes a continued state of inadequate funding, i.e., a level of funding which is not sufficient to meet the needs of the program. At the present time the communications program receives limited funding which has historically been used to attempt some supply of the infrastructure needs. The repeater and HF purchases of the early nineties were part of this effort.

At the time of this plan the most significant challenge is the mandated change of our VHF/FM system to narrowband standards by 1 January 2006. Even with all NHQ communications funding directed at this effort it will only be possible to field a small fraction of the equipment needed for a full change out.

The following table contrasts the expected distribution of appropriated funds for communications acquisition over this period against the level required to meet just the narrowband FM challenge.

	FY99	FY00	FY01	FY02	FY03	FY04	FY05
Expected Distribution	$388k	$388k	$388k	$388k	$388k	$388k	$388k
Required Distribution	$4.3m	$4.3m	$4.3m	$4.3m	$4.3m	$4.3m	$4.3m
Shortfall	$3.9m	$3.9m	$3.9m	$3.9m	$3.9m	$3.9m	$3.9m

Total Expectation: $ 2,716,000
Total Requirement: $30,160,924
Total Shortfall: $27,444,924

As this clearly shows, the present funding situation provides only about 10% of the equipment necessary to prepare our system for the narrowband mandate.

This is a crisis situation and we plan to mitigate this crisis to the largest extent possible by the following.

VHF/FM only. Until adequate funding can be applied to the overall communications program we are forced by the narrowband challenge to concentrate all acquisition efforts for the foreseeable future in this effort. This will mean a suspension of any other acquisition programs such as HF and VHF/AM.

Infrastructure Requirements. The narrowband challenge requires the complete replacement of our 550 repeater fleet. This will require $5.665 million at present market costs. However, in lieu of adequate funding we have begun discussions with Ericsson/GE about the possibility of a retrofit kit to convert our existing 272 GE Master II repeaters to a narrowband equivalent. It is as yet undetermined whether or not the manufacturer will be able or willing to provide such a kit or what the cost might be but we will pursue this as the only available option at this time. It should be understood, however, that this stop-gap measure is an undesirable and temporary situation only, as it requires these repeaters to stay in service well beyond their service life expectancy and provides less than 50% of the needed infrastructure for the system. Only full funding of the communications program will allow us to adequately meet our full infrastructure requirements.

For interim planning purposes we will assume these retrofit kits can be acquired at approximately $1500 dollars each which will provide a limited infrastructure for approximately $408,000. In addition, some of this cost could potentially be met in the FY06 acquisition for those repeaters that are not required to move until the second year of the DoD transition (Jan 06 – Dec 07). Air Force Frequency Management Agency (AFFMA) expects to publish the transition plan approximately two years before implementation date. In light of this and our on-going negotiations with Ericsson/GE, we expect to address infrastructure needs toward the end of this plan and after end user equipment.

End-user Requirements. The narrowband challenge also requires the replacement of our entire VHF/FM fleet of mobiles, portables, and base stations. At present market cost the replacement of end-user equipment will require $20.3 million. With an expected distribution of $2.716 million minus a planned $408k infrastructure stop-gap measure, this leaves approximately $2.3 million available to address end-user equipment requirements. This undesirable situation provides only about 10% of the required assets before the narrowband switchover.

In lieu of adequate funding of the communications program, NHQ will use all available appropriated funding (other than those used for the infrastructure stop-gap measure) to acquire VHF/FM end user equipment. The percentage baseline will be maintained throughout the distribution process. This means that with 10% funding we expect to fill approximately 10% of each wing and regions documented requirements for VHF/FM end user equipment.

End of fiscal year fallout money. Occasionally unspent funds become available both from programs within the organization and from other Air Force projects. NHQ DOK will make all available efforts to acquire year end fallout funds to supplement our current inadequate funding situation.

Future POM (Program Objective Memorandum) Cycles. In the Air Force budgetary planning environment NHQ DOK will continue to expend all possible effort to achieve full funding of the CAP Communications Program.

NTC. In addition, the NTC will focus all efforts on identifying and procuring narrowband compliant equipment for similar field distribution. Most federal agencies began acquiring analog narrowband equipment in the 1995 timeframe. As more agencies move to trunking and digital radio a slowly increasing amount of this earlier acquired analog narrowband equipment will become available. The beginnings of this trend are already apparent. In this Crisis Acquisition Plan, the NTC's primary role will be finding this equipment and acquiring it for addition to our system.

CAP Supply Depot. This plan assumes full responsibility of the communications equipment requirements as a CAP corporate issue. While we feel this is a CAP responsibility it is possible that some members may be willing to purchase narrowband equipment to assist the organization in meeting this challenge. In light of the fact that our current funding profile will provide only 50% of the FM infrastructure needs and little more than 10% of the end-user equipment requirements, it is hoped that some members will accept the challenge. To prepare for this the depot is researching and adding to their product line VHF/FM equipment which meets the narrowband requirements.

Timelines

In light of the upcoming challenges in the communications program one thing has become alarmingly clear: We must update our equipment assets. For many reasons beyond our control the CAP communications program has long specialized in deriving the longest possible use of our equipment resources. It is in many ways a tribute to the innovative talent of our communications technicians that we still rely on equipment which surpassed its life expectancy decades ago. However, most communications managers now realize it is time to move forward with this program.

In just the last few years it has become common knowledge that federal rules for frequency usage---rather than civil rules---govern our operations. This plus the current struggle to meet the narrowband challenge require that we set several very difficult management milestones to the upgrade of the CAP communications system. With National Board concurrence, we propose the following management milestones.

The first four dates deal with the VHF/FM system.

Milestone #1. A date after which we will no longer allow the introduction of VHF/FM equipment into the CAP communications system which does not meet current "wideband" NTIA specifications. In truth this date is legally in the past. With knowledge of the requirements we must comply immediately however, in order to allow wings to set this requirement into motion, the NEC has identified 31 December 1998 as milestone #1.

Milestone #2. A date after which VHF/FM equipment which does not meet current "wideband" standards cannot operate in the CAP communications system. By legal definition this is another date which is already passed. However, mission readiness requires that we postpone this date long enough for the field to prepare for the removal of these assets from service. With this in mind, the NEC has approved 31 December 2001 as milestone #2.

Milestone #3. The date after which corporate or appropriated funds at all levels of the organization will not be expended to purchase VHF/FM equipment which is not "narrowband" compliant. This is a necessary policy step in preparation for the narrowband transition beginning in January, 2006. Because it is important that this migration process begin immediately the NEC has identified 31 December 1998 as milestone #3.

Exception to Milestone #3. In the interest of easing the transition as much as possible, the NEC approved a temporary exception for donated, screened, or personally funded equipment through 31 December 2004. Until this date members and units may introduce equipment which meets the current wideband specs but does not meet the new narrowband specs providing that no corporate or appropriated funds are expended for its purchase. I.e., this is *not* a waiver of Milestone #1.

Milestone #4. The date on which all wings and regions are prepared to move to their new narrowband frequency assignments. By AFFMA mandate this date is 31 December 2005.

The final two dates deal with the HF system.

Milestone #5. Similar to VHF milestone #1 above, milestone #5 is the date after which we would no longer allow the introduction of HF equipment into the CAP communications system which does not meet the current NTIA HF specifications. Like #1 above this is also a date which has legally already passed. Therefore the NEC has approved 31 December 1998 as Milestone #5.

Milestone #6. Similar to VHF milestone #2 above, milestone #6 is the date after which HF equipment which does not meet the current NTIA standards cannot operate in the CAP communications system. Like #2 above, this date is already passed by legal definition, however, mission readiness requires that we postpone this date long enough for the field to prepare for the removal of these assets from service. With this in mind, the NEC has identified 31 December 2001 as milestone #6.

We acknowledge that these program management milestones are aggressive, however, in light of the fact that many of these mandates are already upon us, we must begin movement in the CAP communications program. To provide the widest dissemination possible, these dates will be added to CAPR 100-1 and published to the membership by all available means.

Summary

We understand that the wide spread changes described in this document are far reaching and ambitious. But the time is right for these changes and the communications managers are up to the challenge. Their abilities to hold the system together in the austere days of the past makes them uniquely qualified to manage a system in which tools are provided to assist them. The goal of this plan is to provide those tools.